

RCA 88751, 88752 and 8864 ON 7335
SPECIAL EDITION 2
PERIOD WHEN OVER ONE HUNDRED MILLION PEOPLE
ALL NETWORKED!

One can use Internet even he or she has no personal computer.

(APPEARANCE OF THE INTERNET HOME ELECTRIC
DEVICES AND ITS KEY TECHNOLOGY)

= Internet TCP/IP for the home electric devices is transformed in
the terminal unit!!! =

Access

Related Official Assistant President

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An Internet explosionally spread is information infra. A different information service-condense begins to be offered. Nowadays, there is only a method for performing a blousing of WWW (World Wide Web) and electron mail with usage of a personal computer. Almost each family has a personal computer, but it is still expansive for many general users and its operation is difficult. Beginning from housewives, it is indispensable providing an Internet function as home electric device used the functions to take in a general family user of wide sphere.

In the present article, Internet Soft Wear/Module for home electric devices of access adopted to a device with wide width such as first of all TV, usage terminal, usage word processor, PDA, express device or the like is explained. Also, this article touches the theme of information network society expected one breakthrough by a variation of Internet home electric device and appearance of Internet home electric device.

[WITH AN INTERNET HOME ELECTRIC DEVICE]

[1] Internet more closely.

Almost all Internet users have an access to Internet from his or her office. It is more convenient and easy if it becomes possible to use Internet at home, Internet can be used as if any person watches TV.

Different devices such as TV, game device, usage word processor, electronic pocket notebook and PDA, express terminal or the like are provided as a candidate of Internet home device (FIGURE 1). The level of market sale of these devices over the country nowadays is approximately 15 000 000 (TABLE 1), but if added value will be provided, it is expected that more than 20 000 000 devices will be sold. Moreover, it is expected that more than one hundred million devices will be sold on the world market. On the other hand, 5000000 – 6000000 of personal computers were put on the marketing over the country in 1995 year, and almost all personal computers are for enterprises. Personal computers for home are confined to 10 – 20 percents. In accordance to that, an approach for taking in Internet function from the side of home electric device is a natural flow.

However, so called [incorporation technique] differed from a personal computer soft is required for realizing such an Internet home electric device. An opposition to a different CPU and a hard wear, ROM, realization at a small memory are required.

[2] World of Internet TV.

The centre of an information device in home is, after all, TV. In addition to the prior program broadcasting, different communications such as a satellite broadcasting (BS), communication broadcasting (CS), cable television, teletext broadcasting or the like are tried through a window to an external world which is called TV. If it can be shown in extra line of television channel as a showing method for user of Internet, it is easy to be possessed.

Photo 1 is an image of Internet TV proposed by access. A home page is displayed on TV screen and can be easily operated by a remote controller. A blousing of information turns to the combination with television as it was before such as a remote controller. Not only I am going to do electronic shopping by using a remote controller by one arm lying sprawled in a living room.

[3] Fate of a personal computer which is a device for common use.

In enterprises one personal computer is used by one person. After this also co-ownerships of information, electrification of information continue to be spread as target basic equipment. A personal computer has functions as a common use device, moreover, it has a tendency to be big and with high functions following the progress. Also, speaking about a chip price, a memory with a high capacity more than 10 numbers Mbite and a hard disc of more than, approximately, 100 Mbite are required. This common use point is an advantage and also a disadvantage of a personal computer. At home a device with more simple operation is desired. Hard wear resources are memory with numbers Mbite degree, moreover, it is required to be practiced without two memory devices such as hard disk or the like. After this, a common use target area covered by the personal computer and an exclusive use area covered by an information home electric device become mutually supplemented. User selects devices depending on a purpose. They mutually change information through a network such as Internet or the like.

[A SOFT WEAR FOR INTERNET HOME DEVICE
REALIZED BY ACCESS]

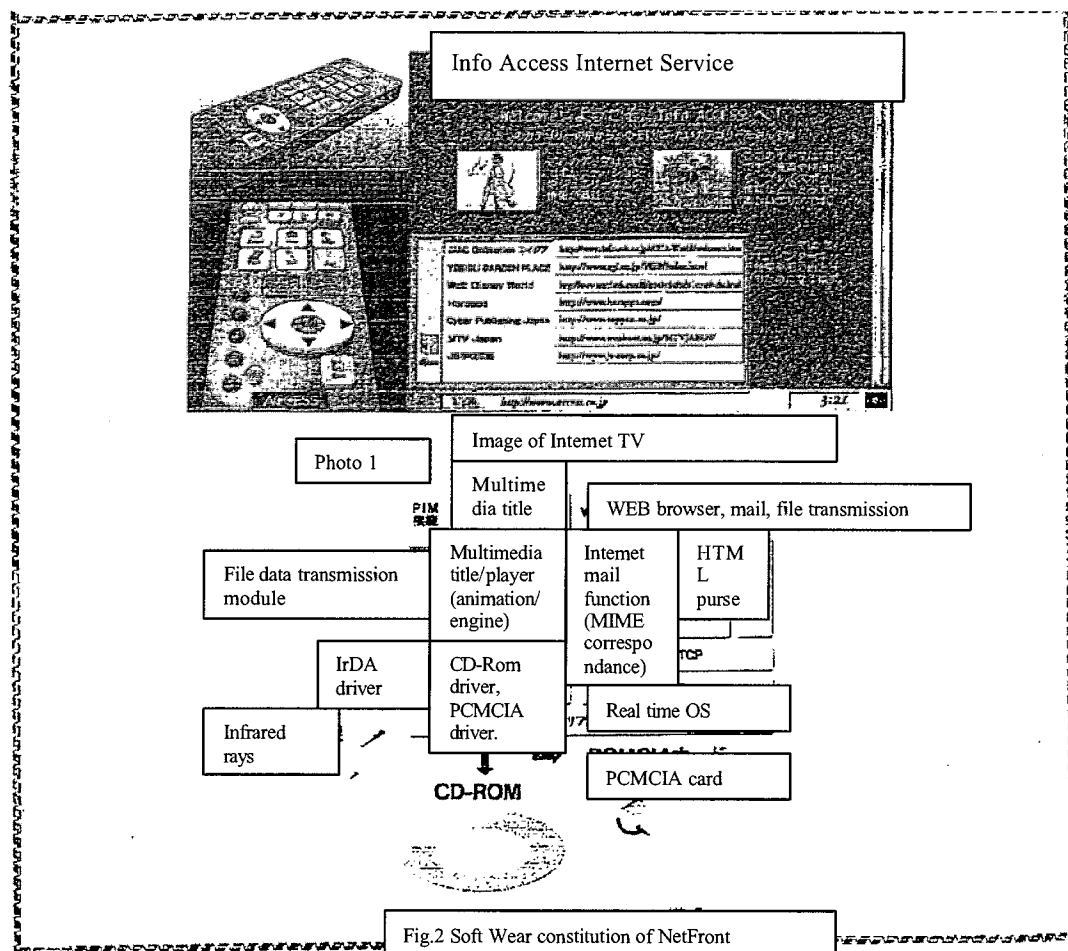
Here, an Internet Soft Wear/Module (NetFront TM) for incorporating a home device provided by access will be explained further below.

[1] Constitution of soft for Internet home device.

A complete set of soft wear called OS, driver, network, application is required in incorporation of Internet function in a home electric device. If a personal computer (PC board) is realized in base, a high price CPU, a memory with more than 10 numbers Mbyte, a hard disc or the like are required. In NetFront TM, functions are wringed in Internet and a complete set soft wear prepared at a maximum form. It is realized at a small memory with number Mbytes, corresponding to a RISC CPU with a high cost performance.

A soft wear constitution of NetFront TM is shown in FIGURE 2. A soft wear is divided in parts, and has a constitution incorporated adjusting a required soft wear parts to device. Inside of it, the central role is played by TCP/IP part (AVE-TCP) processed a communication protocol of Internet. In the Internet period, a selection of OS and CPU becomes not so important, a mutual connection by Internet becomes the most important item. At the access an actual results and experience with a wide width at a sphere of TCP/IP for incorporation are revived [1], and a module capable of ROM specified at home electric device is prepared.

A real time OS (MORE) with a light ITRON base is prepared as a real time OS. The functions required for the real time OS are a basic multitask function (Preemplive) and synchronizing communication (semaphore or the like). If OS which supports them exists, a transplantation is efficient.



There is a protocol process section of an Internet mail and WWW (World Wide Web) in accordance with TCP/IP, and HTTP, HTML purse, SMTP/POP, MIME expansion section or the like are assembled. In their higher rank a user interface section of a mail and blousing is arranged. All their soft wear parts can be ROM, and are efficiently assembled in the real time OS.

Also, in case of device with a CD-ROM driver loading, soft wear parts for the multimedia/title are prepared, in case of portable information terminal, soft wear parts of PIM function are also prepared.

[2] Hard wear constitution of Internet home electric device.

A hard wear constitution for realizing an Internet function is explained further below referring to TABLE 2. Then, a sound source support, moving picture generating hard (MPEG chip or the like), CD-ROM driver or the like are selecte d corresponding to specifications of the device.

A usage method of a flash ROM is for a program version up and memory such as a home page or the like. At the NetFront TM there is a constitution capable of browser function up or the like through a network, therefore, the basic parts of the OS or the like are stored in a mask ROM, and a program capable of version up is stored in the flash ROM.

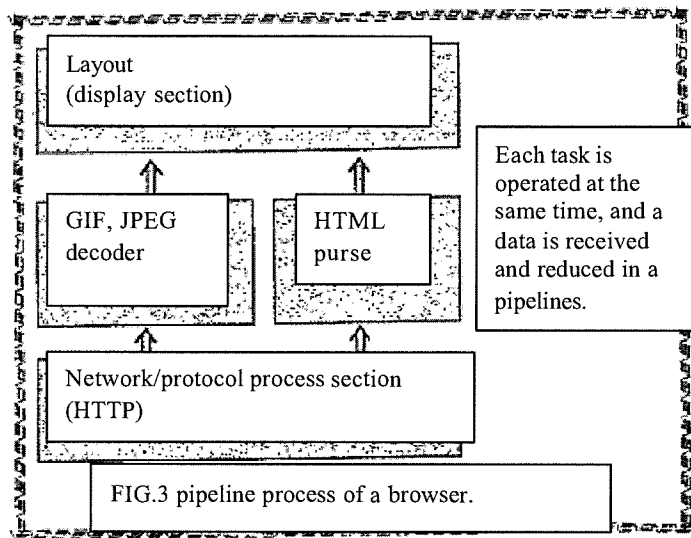
TABLE 2. Example of hard wear constitution for Internet home devices.	
CPU	86 elements, 68000elements, ARM, ETC.
Memory	ROM 1-2Mbyte+font ROM; RAM 1-2Mbyte; flash ROM 1Mbyte degree
Graphic support	Hard support of a high speed bit map transmission such as Dual-Port RAM or the like is desired.
Modem	14,4Kbps or 28,8Kbps

[3] Specification of a browser for home devices.

A browser for home electric devices of access (AVE-Front TM) has a constitution appropriated to the real time OS, and then is established/assembled. For example, in case when an image data (GIF and JPEG) is displayed, each task of the parts received a data from a network, image/decode parts and display parts is operated at the same time (FIGURE 3). In accordance with such multitask pipeline assemblance, there is a merit which doesn't

make a user to be waiting for display, and at the same time a buffer for development finishes with a small amount.

A constitution applied to such a real time OS is indispensable for assemblance of the browser with a good efficiency at a small memory at the exclusive use devices.



[4] A contents for the Internet home devices.

A home page is provided at a configuration HTML standardized, and then can be basically displayed at a personal computer and at Internet home devices. Therefore, the side where contents and service are provided is more efficient when HTML page is created if it is created concluding a degree Internet home device with a screen size. In accordance to a service providing side, if it is supposed to be widely viewed at home, a view that contents are desired to be created in a centre is a natural idea. Nowadays, a guide line of HTML FOR THE Internet home device such as TV set or the like is possible.

[VARIATION OF INTERNET HOME DEVICES]

A soft wear for Internet home devices provided by access is incorporated into different apparatuses. Their product was thrown in the market to the end of 1996 year. FIGURE 4 shows product types of a representative Internet home device.

[1] TV equipped type.

There are types equipped in TV set which is a centre of home. In case of wide TV set, an Internet screen is displayed at the same time with a TV program, and easy usage of the general type simply switched becomes a point. An Internet can be used by a sensation such as one TV channel by a remote controller. It is possible to assemble a fusion of Internet function with a TV program combining with Inter text which is an expansion of teletext broadcasting (URL information flows or the like). If it can be purchased by expensive or chip price in TV main unit, it can be said that it is easy to buy for the user.

Also, it is important to set and then provide an information service (a communication sale, news service, living information or the like) useful for the user.

[2] Set top box type.

It is similar to the TV equipped type at the point when TV set is used as a display device, but it is an external device. One of these approaches is an application of a next generation game device. Modem is connected to the game device and is assembled by concluding a soft wear of Internet function. It can be accepted in the user's layer of the centre of game and a user who has already the game device.

Another one approach is an exclusive use terminal connected to a TV set. It is an external apparatus, therefore, the point that it can be connected to an existed TV set, and the point that it can be easily used in case such as if it is distributed by a trader of a communication sale or a service are merited. In a price relation, TV equipped type is more expensive.

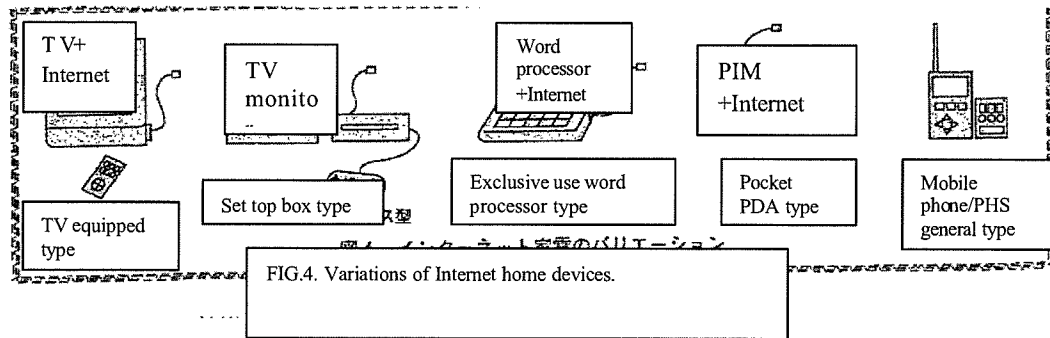
[3] Exclusive use word processor type.

An exclusive use word processor type is a product loaded an Internet function in the prior exclusive use word processor. It is almost enough for many users if there is a function of text creating and printing, mail/browser function of Internet. User can simply do these things by using a personal computer, besides there are enough personal computers in the markets. Personal computers which costs 500\$ are discussed nowadays and it can be said that they are near to this suggestion.

The merit of an exclusive use word processor type is that a mail function can be easily used, and a printing of information received by a network and filling it to a text are simple.

[4] Pocket PDA type.

An approach from a pocket information terminal side assembles an Internet function at PDA connected a modem function. In case of such a device, usually there is a limitation of screen, therefore, it becomes a browser at a screen limited also by a mail function. A sound mail and a mail of a handwriting image are valid functions.



[5] Mobile phone/PHS general type.

In case when a telephone line is provided in the centre, An Internet function is viewed in extent line such as a mobile phone, PHS, pager or the like. It is naturally suggested that a mail can be displayed on a liquid crystal display panel and a sound mail can be used. Also, if an electronic mail/check function is set in a mobile phone or PHS, a communication with user capable of connecting to Internet from any place is possible such as checking an answer phone.

[6] Others.

An Internet connection is already possible in a device with a communication socket or any display device. It is not limited by an application sphere as a display device such as an electronic notice board, home communication karaoke, car navigation device or the like. Also, there is a possibility that a product which has a combination of a new functions and a new entrance product which did not exist till now can appear in a near future.

[WHAT WORLD WILL BE WITH INTERNET HOME DEVICES]

Approximating to the 21 century, it is steady equipped with an information infra. Considering the nearest discussion, the Ministry of Posts and Telecommunications announces if a backbone has a high speed, and NTT announces if a circuit with a high speed of 128Kbps is provided by a charge of the prior 1/10 fixed amount.

A period when homes will be connected by an information network comes soon. A terminal to this network can be called an Internet home electric device/Information home electric device. Different types of living with this new media come across the entrance with a big reform.

[1] Going to the office is a happening of one hour.

A habit to watch TV at home while eating is the same as it was earlier, but a direct mail from a publishing company for

informing about a requested book comes from the side of a news program of oblong TV set screen. Moreover, when a user performs an answer to order by a remote controller, following a voice mail reaches from a foreign country friend, therefore, hearing it, answer OK at a next weak promise. The user didn't watch a sport news yesterday evening, therefore, he or she can see a result of yesterday football competition at a home page. At the end, if user watches economic head line news every morning, when he or she is not at home, he/she can listen to the content of a sound mail down loaded at home through an earphone by using a PDA, for example, going to work in a train. An answer YES/NO can be performed by buttons. When user reaches a station, he/she can complete a transmission by PHS.

It is discussed that it is seemed that such a condition will be in a nearest future. If an information network can be skillfully used, a time for formalities and contacting and wasted minutes can be validly utilized. There are, maybe, many people who are careful, when work amount increases.

[2] Broadcasting + communication + publication = media mix.

It is frequently discussed, that there is no boundary in the prior broadcasting, communication and publication by the Internet, and new different services can appear. An information dispatch utilized an influence power of the prior television office can be performed by a small influence.

It is concluded as an information media if a user level of a general home is taken in. In accordance to that, enterprises really begin a usage as goods information, commercial publicity and a sale route. If this preparation goes skillfully, a commercial publicity media is similar to a commercial broadcasting television, a membership fees is not taken from the user directly, an access side is free, an information providing side takes a responsibility for a cost, it is increased in goods cost and a diagram when a user takes a responsibility indirectly is formed.

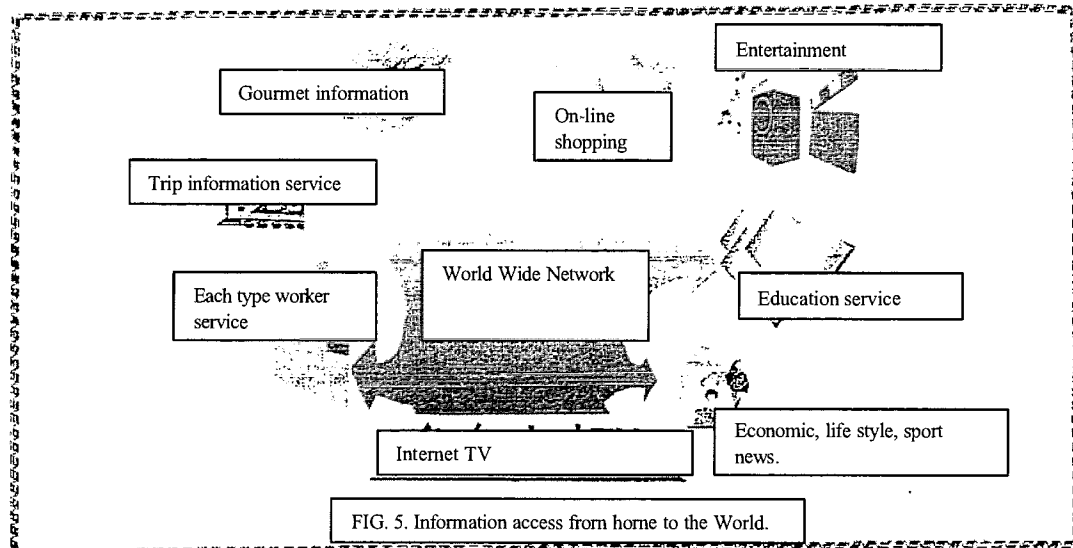
Electronic shopping, electronic publication, different types of information service, so called field projects are provided so as to use this infra at any form (FIGURE 5).

[3] Appearance of numerous dimension societies.

People live in different connections, such as acquaintance with colleges and other people, acquaintance with neighborhoods, a company of people with the same interests or the like, and the information network releases a possibility of people's acquaintance from a space and time limitation. A new communication familiar to a network such as forum or the like is already formed also at a personal computer, but Internet spread it in a world scale. One human being belongs to the different groups such as a group connected by a network according to the common matters, college's service over the network or the like, and it is possible for he/she be active. Many things which were impossible till now by place, distance and time limitation, can be realized now. After this, such a view of numerous dimension societies is required by individualities and by enterprises.

[4] Distinguish of the etiquette.

In accordance with Internet home devices, information is spread from the user who has a professional knowledge of Internet degree to general home users. In case when an information network is used, it is required to be used following common rules as during telephone conversation or letter writing. So called etiquette is required in a network usage so as it troubles similarly to a mischief call. Especially, in case of Internet, because a person simply can dispatch information to the World (public), therefore it extremely loses its cost. In case when information is spread to general homes, an interest should be concentrated on a media, but a counterplan for a criminal should be formed.



[FUTURE DEVELOPMENTS]

Internet home devices, moreover information home devices spread different spheres become a field for development soon. After this, an assemblage of different functions and a correspondence to service are required. At the NetFront TM provided by Access a security function such as SSL (Secure Socket Layer) and expansion of HTML for home devices are already performed. Also, an assemblage for home apparatus of Java, correspondence to a real time audio, combination with DVD, MD, CD-ROM are performing now.

Reference works]

- [1] Special publication [Incorporation TCP/IP practical usage], Interface, December, 1994. CQ publish company.
- [2] [Whether a period of Internet come devices comes?], Nikkei Business, December, 1995, ? 4. Nikkei BP Company.

[Summary]

It is described a discussion of information network Company according to appearance of varieties of Internet home devices and Internet home devices as the centre of Internet soft wear/module [NetFront] (registered trademark) for home device incorporation provided by Access. At the NetFront soft wear parts capable of ROM such as HTTP, HTML purse, SMTP/POP, MIME expansion part or the like are set and assembled at an appropriate constitution to a real time OS (MORE) based on ITRON with the browser for home electric devices (AVE-Front) as WWW and Internet/mail protocol processor to TCP/IP (AVE-TCP) processed a communication protocol of Internet. A soft wear for the present Internet home devices produces a great varieties of Internet home devices such as (1) TV equipped type, (2) set top box type, (3) exclusive use word processor, (4) pocket PDA type, (5) mobile phone/PHS general type or the like, and the Internet is spread to a general home user by connecting home to an information network. Also, there were no bounders in the prior broadcasting, communication and publication by the Internet, therefore different new services could easily appear. Moreover, all field enterprises such as electronic shopping, electronic publication, different types services or the like are provided if this information infra is used at any type and if world scale numerous dimension societies appear.

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exclusive use word processor, mobile telephone/PHS type,
electronic shopping, electronic publication, Internet TV, soft
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